SOCIAL SCIENCE TOOLS FOR COASTAL PROGRAMS

Stakeholder Engagement Strategies for Participatory Mapping

NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

Social Science Tools for Coastal Programs

Stakeholder Engagement Strategies for Participatory Mapping

About This Publication

Some of the most challenging decisions in coastal management stem from the relationship between people and the environment. The National Oceanic and Atmospheric Administration's Coastal Services Center provides technical assistance to coastal management professionals addressing complex human-based problems. "Stakeholder Engagement Strategies for Participatory Mapping" is the fourth in a series of publications developed to bring information to this audience about the use of social science tools in their field of work. For additional information about social science tools and applications, please visit *www.csc.noaa.gov/cms/human_dimensions/.*

About the NOAA Coastal Services Center

The Coastal Services Center, an office within the federal government's National Oceanic and Atmospheric Administration (NOAA), works with state and local programs devoted to the wise management of our nation's coastal resources. The NOAA Coastal Services Center provides these programs with tools, training, and expertise that might otherwise be unavailable. To learn more about the products and services available from this agency, visit *www.csc.noaa.gov.*

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Introduction

Participatory mapping is a general term used to define a growing toolbox of techniques that can help communities make land use decisions.

These maps go beyond the physical features portrayed in traditional maps; nearly everything valued by the community can be expressed in spatial terms and represented on a participatory map, including social, cultural, and economic features. The process used to create the maps is as valuable as the maps themselves, since participants often find themselves more fully engaged than they would have otherwise.

This publication provides some simple strategies for facilitators leading a participatory mapping process. While there are many aspects of participatory mapping, this publication focuses primarily on stakeholder involvement. Topics addressed include

- Understanding participatory mapping basics
- Knowing when participatory mapping is appropriate
- Identifying and working with stakeholders
- Developing a mapping strategy
- Collecting information
- Validating and analyzing information
- Reporting information

Another document in this series of social science publications produced by the National Oceanic and Atmospheric Administration (NOAA) that could be helpful when considering participatory mapping is "An Introduction to Stakeholder Participation." Contact the NOAA Coastal Services Center to receive a copy.

Background

Spatial representations of coastal issues, namely maps, have long been a critically important tool for coastal resource managers. Maps allow for a clearer understanding of an endless variety of coastal issues from population growth to sea level rise to ways that people use coastal resources for recreation and livelihood. Many coastal management agencies employ staff members devoted almost exclusively to mapping, and they often specialize in organizing and depicting spatial information through the use of a geographic information system (GIS).

More recently, traditional top-down, agency-driven decision-making in coastal resource management has moved toward processes that involve stakeholders (those who have an interest in or are affected by a decision) and acknowledge the importance of public attitudes, perceptions, beliefs, and knowledge. Increasingly, GIS specialists and others involved in mapping are finding themselves in a new role of engaging stakeholders—working with the public to collect, depict, and interpret new information that helps when making decisions about coastal resources.

Known as participatory mapping, this convergence of stakeholder participation and mapping techniques is becoming a popular tool for coastal managers. From maps drawn literally in the sand to complex on-line data collection and mapping using GIS, participatory mapping can simultaneously provide

- A way to engage stakeholders near and far
- Objective local information on coastal resources
- Traditional knowledge and practices from the community
- Information on how communities perceive, value, and use coastal resources
- A focal point for discussions on coastal issues
- A valuable tool to support decision-making
- Graphical and easily understandable communication tools

The literature offers a great variety of definitions for participatory mapping and related terms, such as participatory GIS, community mapping, and public participation GIS. Generally, however, the literature describes participatory mapping as a general term for gathering and mapping spatial information to help communities learn, discuss, build consensus, and make decisions about their communities and associated resources.

How Participatory Mapping Is Used

Participatory mapping is a powerful tool that increases stakeholder involvement and provides a means for participants to express their ideas in an easily understandable visual format. Participatory mapping is commonly used in the following ways.

- **To create** maps that represent resources, hazards, community values, usage (e.g., for recreation or other visitor use), perceptions, or alternative scenarios
- **To gather** traditional knowledge and practices and to collect information (hazards, environmental, socioeconomic, visitor use, etc.) for assessments or monitoring
- **To identify** data gaps
- **To inform** other data collection methods (e.g., formal surveys, interviews, etc.)
- **To evaluate** existing programs, plans, and activities
- **To facilitate** the decision-making process
- **To assist** with data gathering for research
- **To empower** stakeholders
- **To conduct** trends analysis
- **To educate** stakeholders about issues and interrelationships of resources outside their immediate areas of concern

Coastal Community Resilience Assessment and Planning for the Indian Ocean

A guidebook, *How Resilient Is Your Coastal Community? A Guide for Evaluating Coastal Community Resilience to Tsunamis and Other Hazards,* was one result of an international coalition dedicated to helping communities in Sri Lanka, Thailand, and Indonesia protect themselves from natural hazards.

During the development of the publication, the team piloted many of the assessment techniques within coastal communities that were most impacted by the December 26, 2004, Indian Ocean Tsunami. The community resilience assessments included the use of participatory mapping. This mapping, combined with other stakeholder engagement methods, allowed organizations with limited knowledge of local issues, needs, customs, and values to conduct meaningful assessments. These assessments are helping all three countries rebuild in a more resilient manner.

Organizations on that team included the NOAA Pacific Services Center, U.S. Agency for International Development, Asian Disaster Preparedness Center, University of Rhode Island Coastal Resources Center, and Tetra Tech Inc.

Participatory Mapping Methods

- Community mapping with paper maps
- Conversion of community paper maps into GIS maps
- In community centers, distribution of tsunami evacuation maps that were created using GIS to incorporate the data from the community mapping efforts

Challenges

- Outsiders coming into communities need to build relationships and trust first.
- In some of the countries, cultural differences made it more difficult to get community values from both genders, but this information is vital for conducting a comprehensive assessment.
- Many community members were not accustomed to reading maps and aerial images, so in many cases the community members drew their own maps.

When Is Participatory Mapping Appropriate?

Because every situation is different, it isn't always clear when participatory mapping should be considered. Participatory mapping generally isn't appropriate for minor decisions because the process can be time-consuming and requires significant planning. More complex situations with far-reaching impacts, however, usually warrant some type of stakeholder involvement. Participatory mapping may be an option in these cases.

Consider using participatory mapping for the following situations.

Initial data collection when . . .

- A better understanding of the issue is needed and the maps will be a valuable communication tool
- Perceptions are needed to help guide next steps
- Traditional knowledge can contribute to scientific understanding and facilitate future interactions
- Stakeholder engagement is needed to monitor and evaluate the success of existing programs, plans, and activities
- Additional information is needed to better inform other stakeholder engagement processes such as formal surveys

Validating and ground-truthing collected data when . . .

- Maps will visually enhance stakeholders' understanding of the data collected
- Uncertainty exists about certain data and their spatial relevance
- The process will help stakeholders better understand the issue you are trying to address with the data collected

Decision support when . . .

- Visually displaying scenarios will enhance stakeholder understanding and awareness
- Visually displaying alternative solutions will provide stakeholders with an opportunity to provide feedback
- The process can enhance other stakeholder-engagement methods—for example, during a focus group to help visualize issues and resources and thereby stimulate discussion

- The process will help develop alternative solutions generated by stakeholders
- The maps can help foster a more holistic or ecosystem approach by educating stakeholders about the issues and interrelationships of resources outside their immediate areas of concern

Fostering stakeholder support when . . .

- The process can help empower the stakeholders to develop solutions
- Projected solutions may be controversial, rather than unanimous—for example, creation of a no-take zone in a marine protected area
- The process can help foster successful implementation

Since participatory mapping requires significant time and resources, it may not be feasible or effective for all situations. Use participatory mapping when the process will benefit the overall purpose. The following sections provide some strategies for proceeding.

Resilience-Minded Regional Planning in Mobile Bay, Alabama

The Mobile Area Chamber of Commerce led a series of regional planning efforts that focused on 12 separate but interrelated systems that are crucial to a healthy community. The effective use of this planning framework required the support of a large number of partners represented by about 150 people from government, nongovernmental organizations, academia, and the private sector. Participatory mapping methods were used to guide the data collection. Through these methods, participants from widely varying backgrounds were able to view, discuss, assess, and contribute data and information.

Participatory Mapping Methods

- Paper maps were printed for use in a series of public meetings. Participants were able to see the maps before the meetings, during the meetings while experts explained information and asked questions, and after the meetings.

Challenges

- Participants had only a limited time to interact with the team after the meeting.
- This was the first exposure that most participants had to the project. Thus, the meeting time was divided among introducing the project, introducing the data, and soliciting input.

Identifying the Stakeholders

A key first step in all stakeholder engagement is to identify or inventory the relevant stakeholders. Involving these individuals and organizations early on will help ensure the long-term success of the project. The following table describes five categories into which most stakeholders will fit, and provides examples of each. This table can be used to start a group brainstorming session for this task.

Table 1: Categories of Stakeholders

Stakeholder Category	Description	Examples
People who live, work, play, or worship at or near a resource	Those whose everyday lives and well-being are directly connected to a resource or issue. This group is essentially made up of the "neighbors" of the issue, and they should be invited to participate because their everyday lives may be impacted.	Residents, resource users, businesses, community and civic organizations, interest groups and nongovernmental organizations (NGOs), government, Native American tribes, and the media
People interested in the resource, its users, its use, or its non-use	Those who assign values to a resource and are concerned about the way that resources are used. This group includes those who extract value from resources, as well as those more interested in conserving or protecting resources. This group should be invited to participate because of the sheer interest in the resource or issue.	Businesses, resource users, interest groups and NGOs, community and civic organizations, government, and Native American tribes
People interested in the processes used to make decisions	Those deeply interested in the legal and procedural aspects of an issue. This group includes those who want to ensure that all relevant policies and procedures are observed in reaching a decision. They should be involved because of their attention to procedural detail and their ability to derail a process or litigate final decisions.	Interest groups and NGOs, government, the media, residents, and Native American tribes
People who are financially involved	Those whose money is directly or indirectly used to fund resource management through taxes, fees, and other means. This group wants to ensure that money is spent wisely and should be invited to participate because the government is accountable for how it spends public dollars.	Residents, resource users, businesses, and government
People who represent citizens or are legally responsible for public resources	Those who have the legal authority and obligation to manage natural resources. Members of this group want to ensure the best final decision is reached and should be invited to participate because it is their duty.	Government

(Meffe and others 2002)

Considerations for Working with Stakeholders

Knowing Your Stakeholders

After developing an initial understanding of the stakeholders involved in an issue, performing a more detailed stakeholder analysis can be useful. Age, gender, culture, and many other variables influence how a participatory mapping effort will be received. A stakeholder analysis provides this additional information. The more that is known about the stakeholders, the better the process and the results. A stakeholder analysis can also be used to identify gaps in stakeholder representation.

Stakeholder analysis involves asking a standard set of relevant questions of all those targeted for participation in the project. These questions can be directed at some of the finer information needs surrounding your participatory process, such as the level of technology that should be used, the time and day of the week meetings should be scheduled, and the identification of stakeholders who do not interact well with one another.

Data for a stakeholder analysis can be collected through several avenues, including secondary information sources (e.g., websites, newspapers, public reports), direct communication with stakeholders (e.g., interviews and attendance at stakeholder functions), and interaction with a local host who is thoroughly familiar with local social and political landscapes. Establishing a relationship with a local host who is willing to introduce the project and the project team to the community offers the dual benefits of providing important information on stakeholders and gaining community trust and support.

Community Resilience Mapping in Hawaii

Participatory mapping was used in Hawaii to guide the development of a stream management plan and to integrate hazard resilience goals into the community planning process. The focus was on the waterhead leader system, which is a culturally rooted physical and social watershed management system. The mapping exercise not only provided an opportunity for youth and *kūpuna* (elders) to learn from each other and integrate intergenerational perspectives into the planning process, but it also helped raise public risk awareness.

The participatory mapping process provided a unique opportunity to incorporate traditional Hawaiian knowledge and practices into a socially acceptable stream management plan. Cultural and social acceptability were critical to the success of the plan since it had to be implemented by the local community without any assistance from government. For this effort, the Pacific Risk Management *O`hana* worked with the Waipi`o Valley Community Stream Management Council and the Natural Resources Conservation Service (NRCS).

Participatory Mapping Methods

- Historic maps were overlaid to compare past and current stream course ways, physical water management systems, location of past hazard events, and crop productivity.
- Global Positioning System (GPS) data points were collected of the physical waterhead system, high-risk areas, and resilience assets within the valley.

Challenges

- Some people had difficulty orienting themselves to aerial maps because the site is rural, with few recognizable landmarks.
- Managing expectations of the ability of the map and planning process to assist in conflict resolution and decision-making was challenging.

Transparency

Transparency is a key element of participatory mapping and working with stakeholders. Transparent processes are those in which relevant information is widely available to the public, particularly information that facilitates greater understanding of decision-making. Transparent processes can alleviate participant suspicions about government agencies, other stakeholders, and the fairness of decisions. Alleviating these suspicions can be especially helpful in contentious situations. Specifically, managers or facilitators should clearly explain and openly answer questions about

- The structure and timeline of the participatory mapping process
- Ways stakeholder information or data will be used
- The timeframe when stakeholder input will be needed
- The degree to which stakeholder input will influence final decisions
- Capabilities and limitations of the process and technologies being used

Managers should be flexible and willing to adjust the proposed process if stakeholders voice concerns about the structure of the project.

Having the Right Skills

Working directly with stakeholders in even a simple participatory mapping exercise may require several specialized skills. After completing a stakeholder analysis and beginning to investigate specific methods for completing the project, consider whether the following basic competencies are needed.

- Mapping or other technical skills—depending on the methods used for the project, technical expertise may be required to provide basic training to stakeholders in certain technologies.
- Process and meeting facilitation skills—even in non-contentious and non-confrontational situations, having basic skills in meeting facilitation can ensure that stakeholder interactions are positive and productive.
- Social science skills—some participatory mapping projects use surveys, interviews, focus groups, or other social science methods to collect information from stakeholders. Having a trained social scientist involved can ensure that the needed information is obtained.

Developing a Mapping Strategy

A wide variety of methods can be used to collect information for a participatory mapping exercise. In some cases, facilitators may bring stakeholders or representative groups together to perform the mapping exercise. In other cases, it may be more useful to have stakeholders provide their data individually and come together to explore the responses as a group. The decision is best made according to the individual needs of the project and the preferences of the stakeholders.

The needs of a project may not be met by a single participatory mapping exercise or by the use of a single method. For example, it may be useful to use on-line mapping tools with an expert stakeholder group and to integrate those data into a paper mapping exercise with another group of stakeholders.

The technical capacity of the participants involved in the participatory mapping exercise is a critical consideration. Some users may not be familiar with maps or may be uncomfortable or unfamiliar with some technologies. Balancing the comfort level of participants with the technologies used in the mapping exercise will alleviate a host of issues. In many cases, the project team may provide training in the use of a technology to help stakeholders feel more comfortable with the process and the products.

The mapping goals and the stakeholders involved will play a key role in the mapping process and how the information will be recorded and analyzed. There are four primary concerns for the actual mapping exercise once the team has established the project goals.

- How will the map be used or analyzed to make decisions?
- What are stakeholders going to map?
- What methods will stakeholders use to map things?
- How will the maps be used in the future?

To answer these questions, it is extremely important to review the stakeholder analysis and the goals of the participatory mapping effort mentioned in the previous sections. The goals of the effort and the stakeholders will help determine how best to address the next steps of the participatory mapping project.

Conservation Planning on Edisto Island, South Carolina

The Edisto Island Preservation Alliance is a conglomeration of conservation-minded groups working to preserve Edisto Island's rural and agricultural way of life through community-driven growth management and proactive initiatives. The participatory mapping efforts contributed to the alliance's voice in updating the county comprehensive plan, application for a National Scenic Byway designation, and visitor education.

Facilitators from the NOAA Coastal Services Center and the ACE Basin National Estuarine Research Reserve assisted the alliance as it used participatory mapping to identify key areas for preservation.

Participatory Mapping Methods

- Participants learned how to collect nontraditional, locally significant data using a handheld Global Positioning System (GPS). They collected GPS data on the locations of historic churches, cemeteries, and scenic views. Participants also improved existing roads data by adding commonly used names to the attributes.
- Research reserve staff members helped update and combine conserved land information into a single data file that matched legal parcel boundaries.
- In combination with stakeholder input, GIS software (the Habitat Priority Planner) was used to identify areas on Edisto Island facing the greatest threats from development, and those that were most important to preserve.

Challenges

- Facilitators were required to provide thorough explanations of maps, GPS units, and software used during the process to help participants feel comfortable and confident in the process.
- Facilitators had to be able to manage expectations by clearly explaining the limitations of the data and software used for analysis.

How Will the Map Be Used or Analyzed to Make Decisions?

Clearly, knowing the intended uses of the data being collected is critical to ensuring that the right data are gathered. Having a clear sense of how the data will be used and visualized will help shape the ways the data are collected. For example, if the mapping effort will have policy, legal, or financial implications, the level of attention paid to accuracy may be higher. Further, if the data will ultimately become part of a digital database, then it may be more important to try to collect data digitally to avoid complications involved in transferring paper sketches into a digital format.

Knowing the long-term use of the maps and data will help define how the project should collect and store the information. Questions to consider include the following:

- How will the information be shared and used?
- How much detail is needed to address the issue?
- What additional data might be needed?
- What are the best mechanisms to convey the results so that they can be easily understood by all parties?
- Will the final products be printed or electronic?
- Will information be presented in town meetings, forums, stakeholder groups, or formal reports?

What Are Stakeholders Going to Map?

From a mapping perspective, it is critical to have a clear idea about what features need to be mapped and how those features will help answer the questions the project is trying to address. In most cases, features identified in a participatory mapping effort will be represented through one of three different category types: points (e.g., a school), lines (e.g., a school bus route), or polygons (e.g., areas such as school districts). Identifying the appropriate category type for each map feature will help define how that information may be represented on the map.

With that said, choosing a category type can be tricky. The features mapped by the stakeholders will influence the questions that can be asked of the data and the future decisions that can be based on the maps. In some cases stakeholders may feel more comfortable identifying areas instead of single points. For example, fishermen may not be comfortable identifying the specific coordinates of their preferred fishing areas because they fear others will use their favorite spot. Working directly with stakeholders when determining what will be mapped will help ensure that these considerations are included. Facilitators for the mapping effort can help participants explore ways to map the desired features while still honoring participant concerns.

What Methods Will Stakeholders Use to Map Things?

Once the project team and stakeholders have identified what will be mapped and the goals of the map, the team should consider the actual process of placing the features on the map. One of the most important aspects to this step is knowing the technical capacity and comfort level of the stakeholders. This information can help the team avoid unnecessary confusion and frustration. In some cases, a project may find it easiest to use paper maps or ones drawn literally in the sand. In other cases, where the mapped data may be used for digital analysis, it may be worthwhile to explore ways to digitally collect and store the maps. Finding ways to make the mapping exercise comfortable and efficient for the stakeholders will improve the final product.

How Will the Maps Be Used in the Future?

Identifying the resources available for the initial participatory mapping effort and the long-term maintenance of the data can also shape the ways data are collected. If, for example, a community plans to sketch its data onto paper maps and store those maps in a community center, it may not make sense to convert the maps to a digital format, especially if computer access and technical capacity are limited.

When planning the participatory mapping project, for more formal map products the stakeholders should identify who will keep the maps and determine the acceptable ways the maps should be used in the future. In cases where the mapping exercise may produce a temporary map, like one drawn in the sand or in sketches on paper, the stakeholders may want to ensure their decisions are recorded in a narrative.

Addressing these issues before starting the participatory mapping process helps ensure the usefulness of the effort and enhances the transparency of the project.

Table 2: Mapping Methods

Method	Pros	Cons
Paper Maps Maps can be created that contain pertinent information and can be printed large enough for participants to view, mark on, discuss, etc.	• Simple to explain • Can use to collect data • Inexpensive • Usable by most participants • Economical and can be used anywhere • Can be mailed	• Static • Lacks flexibility • Not interactive • May be limited by participants' understanding of maps
On-site Walk With participants, collect data using video, photography, GPS	• Simple • Relatively inexpensive • Interactive	• Limited numbers of participants • Questions limited to geography • Potential bias from limited stakeholders • High potential for interviewer bias and inconsistency • Mobility issues may occur
Interview Administer questions to individuals or groups with spatial references. No maps required	• Simple • Inexpensive • Interactive • Does not require ability to read maps	• Difficulties in interpreting results and translating to paper • Limited questions • Extensive knowledge of local geography and landmarks required (participants and interviewers)
On-line Mapping Tools e.g., Google Earth, GeoPDF, OpenStreetMap	• Inexpensive • Can use for data collection • Data easily transferred to GIS • Widely available and accessible • Can be posted on a website	• Developer needs to build interface • Limited functionality • Users must have computer access • Users may need to download software
Geospatial Software e.g., ArcGIS, CommunityViz, Habitat Priority Planner	• Interactive • Flexible • Thorough	• Requires expert to operate • May require other software • Expensive

(Integrated Approaches to Participatory Development 2009)

Participatory Mapping and Coastal Conservation in Southern Maine

The NOAA Coastal Services Center teamed with the Wells National Estuarine Research Reserve to assist the Great Works Regional Land Trust with setting goals for strategic conservation planning. The land trust, with over 800 members, serves six communities in southern coastal Maine, focusing its resources on three habitat types: forests, riparian buffers, and agricultural land preservation (*www.gwrlt.org*).

Participatory Mapping Methods

- The land trust steering committee gathered information through interviews, surveys, and outreach on important features for conservation in the six-town area.
- GIS software (the Habitat Priority Planner) was used to identify locations, acreage, and areas of overlap of the three key habitat types. This information was used to create 5-, 10-, and 25-year conservation goals to be incorporated into the Great Works Regional Land Trust's strategic plan.

Challenges

- This strategic conservation planning effort was a first-of-its-kind in this region. Members had to learn how to work with the public, create useful surveys, and interpret meaningful results as they progressed.
- Steering committee members were volunteers with full-time jobs. They had limited time to work on land trust goals.
- Center and research reserve staff members had to provide transparent explanations of the capabilities and limitations of the technology.

Testing the Mapping Strategy

With clear goals, a strategy, and the necessary resources in place, project teams sometimes forget to test their process. Testing the strategy allows the project team to identify a host of issues before involving stakeholders, who likely have limited time to devote to the project. Performing a practice run allows the team to identify

- Directions that may be confusing
- Processes that could cause difficulty
- Areas where technology or tools could hinder the process
- Gaps in data or knowledge that need to be resolved before beginning the exercise

Testing the process doesn't need to be difficult. Using colleagues or friends with similar backgrounds or experiences to your stakeholders can be the easiest way to make sure the directions are clear and accurate.

Collecting Information

A skilled facilitator can assist in avoiding a number of problems that can arise during any stakeholder exercise. It is important to understand that multiple iterations of the participatory mapping exercises may be necessary to collect all the relevant information. In some cases, feedback from participatory mapping interactions with one set of stakeholders may require follow-up interactions with other stakeholders.

Validating and Analyzing Information

Once data collection from the participatory mapping process is complete, the project team should solicit help from stakeholders in validating the accuracy and completeness of the data. Data evaluation is a means of checking for errors and omissions, ensuring that sufficient information is available to perform the final analysis, providing additional transparency to the process by placing stakeholders in control of the information they provided, and identifying data of particular interest to stakeholders that can be highlighted in the final map products and reports.

In some cases, where data are gathered and analyzed directly with the stakeholder, the process of validation may be instantaneous. In the case where multiple iterations of data collection are performed, or where data are compiled from many sources and stakeholders, it may be useful to bring interim products back to stakeholders to ensure the information was collected and compiled correctly. Project participants may want to consult with partners and stakeholders, as well as independent parties, to see if the data make sense to them and to ensure that there are no obvious omissions.

The final maps should accurately reflect the knowledge and values of the stakeholders. Some sample questions to ask during the evaluation and validation of data might include the following:

- How complete are the data? Are features missing?
- Are the locations and positions of features on the map accurate?
- Are there other features that should have been mapped but were missed?
- How could the map be improved?

Reporting Information

An important first step in this part of the effort is sharing project findings with all project participants. Stakeholders who engage in participatory mapping generally sacrifice time away from work or personal matters to do so. Providing stakeholders with the final results of a group's work, and showing an individual's input in the context of the broader group's ideas, is a common courtesy that reinforces that the stakeholder's time was well spent. Sharing these products can also help participants and the public understand how their opinions resemble or differ from others, which can potentially reduce conflict and create new relationships among stakeholders.

Of course, project findings must also be shared with decision makers and other target audiences. Although finding simple and direct ways to communicate the results can be challenging, reviewing the stakeholder analysis and having insight into how other audiences prefer to receive information will help the project team identify effective means of communication. Project teams should consider sharing information with stakeholders through a variety of media such as websites, paper maps, reports, oral presentations, articles, podcasts, and group e-mails. Participating stakeholders themselves can also be a valuable means of reporting information, since they can be empowered to create and deliver summaries of the information, suggest next steps, and perform other outreach and communication duties.

Conclusion

Much like other techniques for stakeholder engagement, participatory mapping is not appropriate for all situations and does have its limitations. For example, participatory mapping can be time-consuming, particularly when multiple methods are used, and can demand many resources. Additionally, the success of participatory mapping depends highly on the capabilities of the stakeholders involved, so some methods will not be feasible for certain audiences.

Participatory mapping is, however, a powerful tool that can simultaneously serve to create opportunities for stakeholder participation, capture important new information, and help participants make better coastal management decisions. Although there is no adequate "one-size-fits-all" approach to participatory mapping, this document focuses on the human dimensions of the process, providing some simple strategies for facilitators working with stakeholders.

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